

ABSTRACT OF THE DISCLOSURE

A wide-area electrostatically- actuated shutter is provided that includes a thin, flexible, diaphragm that is placed between two rigid electrode structures. In one embodiment of the invention, the diaphragm has a set of openings in it. These openings overlap
5 with corresponding openings in one of the rigid electrodes such that when the diaphragm is contiguous to that electrode, the openings provide apertures through which vaporous fuel can flow. The opposite electrode does not have overlapping openings, thus it forms a seal that prevents gas or vapor from passing through it when the diaphragm is in contact with the opposite electrode. The shutter is actuated electrostatically by an associated
10 driver that applies a voltage to the diaphragm such that when the high voltage is applied to the diaphragm, the diaphragm is attracted to the fixed electrode that is tied to ground. Alternatively, when is desired to place the shutter in the opposite position, the diaphragm is placed at ground, which, in turn, pulls it towards the fixed electrode that is at a high voltage, to adjust the shutter. The shutter can be rapidly opened and closed at a high frequency
15 in a PWM mode or a PFM mode.